## REMARKS

Claims 1-3 and 10 are under examination and have been rejected.

### Claim Objection

Claims 2 and 3 were objected to as failing to further limit the subject matter of claim 1. Applicants disagree. Claim 1 was directed to an isolated immunogenic polypeptide comprising amino acid residues 25-186 of SEQ ID NO: 29. Claim 2 was directed to the polypeptide of claim 1 and comprising the N-terminal two-thirds of SEQ ID NO: 29. SEQ ID NO: 29 is 279 amino acids residues in length so that two-thirds represents 186 residues. Thus, the N-terminal two-thirds comprises residues 1-186, which includes 25-186, and thus further limits the subject matter of claim 1. In the same way, the polypeptide of claim 3 comprises the entirety of SEQ ID NO: 29, thus including residues 25-186 and thus further limiting the subject matter of claim 1 just as claim 2 does.

Applicants respectfully contend that this ground of objection is improper and should be withdrawn.

### Election of Invention

In response to the Examiner's comments Applicants note that if a claim is directed to a polypeptide comprising a sequence having at least 95% identity to a stated sequence and is found allowable, then any polypeptide comprising a sequence with that sequence identity or higher is likewise allowable regardless of the actual sequence.

Thus, any polypeptide comprising residues 25-186 of SEQ ID NO: 29 is covered by claim 1 and that includes any and all sequences disclosed in the present application regardless of the actual sequence on either side of this stretch. With respect to the Examiner's example concerning cars, Applicants note that a claim directed to a motive device comprising an internal combustion engine covers all cars, regardless of structure, year make or model, as well as covering boats, planes, motorcycles, etc. That is the law of patents.

**Rejection Under 35 U.S.C. §112, ¶2**

Claims 2 and 3 were rejected as indefinite under section 112, paragraph 2. Claim 2 was rejected for use of the phrase "further comprising about the N-terminal two thirds of the sequence selected from SEQ ID NO: 29." Applicants contend that this meaning is clear but have amended the claim to delete the word "further" from the limitation. Applicants believe that claim 2 is now sufficiently definite.

Applicants gratefully acknowledge withdrawal of the rejection of claim 3 for indefiniteness.

**Rejection Under 35 U.S.C. §102**

Claims 1-3 and 10 were rejected under section 102(b) as anticipated by Accession No. AC P08191 or Krogfelt et al (1990).

As to Accession No. AC P08191, the Examiner contends that an alignment of

the sequence disclosed in the reference and that of SEQ ID NO: 29 shows a 98.2% match. However, the rejection is under 35 U.S.C. 102(b) thus the reference must recite each element of the claim. The fact that the Examiner concedes that there is only 98.2% identity is sufficient to remove this ground of rejection.

The Examiner also argues that residues 26-119 of SEQ ID NO: 29 are contained within the sequence of the reference polypeptide. Applicants respectfully respond that this is not relevant. The reference again fails to recite the basic limitation that the claimed polypeptide comprises residues 25-186 of SEQ ID NO: 9.

Applicants note that a reference cited under 35 U.S.C. 102 must recite each and every limitation of the claim in order to negate novelty. Bits, pieces and approximations are not sufficient. Applicant requests that this ground of rejection be withdrawn.

Claims 1-3 and 10 have also been rejected under 35 U.S.C. 102(b) as anticipated by Krogfelt et al (1990).

In response, Applicants initially note that the Krogfelt et al (1990) reference is the disclosure of the polypeptide sequence of Accession No. P08191 (already cited). In addition, the Krogfelt et al paper does not specifically disclose any sequence. That being said, Applicants reiterate their response to the rejection based on Accession No. P08191 in that it fails to recite the limitations of Claim 1, viz., that the polypeptide comprise residues 25-186 of SEQ ID NO: 29. The reference polypeptide does not do so.

In addition, the Examiner has relied on mention in Krogfelt et al (1990) of the use of a mannose-BSA conjugate as filling the role of the "pharmacologically acceptable carrier" recited in claim 10. However, Applicants believe that this is not relevant

because claim 10 merely recites a composition comprising the isolated polypeptide of claims 1, 2 or 3. Because Krogfelt et al (1990) does not recite such an isolated polypeptide it makes no difference what she suspends it in. Thus, claim 10 avoids the Krogfelt et al (1990) reference for the exact same reason that claim 1 does. The reference simply does not recite an isolated immunogenic polypeptide that comprises residues 25-186 of SEQ ID NO: 9 and anything else that this reference recites is irrelevant.

In addition, mannose-BSA would not constitute a pharmacologically acceptable carrier because if FimH were suspended in such a "carrier" it would bind to the mannose (that is what it does *in vivo* – it binds to mannose on the surface of cells and thereby attaches the bacterial cell to the mammalian cell surface) so that the FimH would then be devoid of utility for its intended purpose. Thus, for FimH, of the isolated polypeptide of the invention, mannose (whether bound to BSA or not) is not an acceptable carrier if it ties up the portion of the polypeptide that facilitates its utility. If one looks at the legend of Figure 2 in Krogfelt et al, it states in the last 4 lines that D-mannose-BSA reacts uniquely with FimH. Of course, such reaction would void utility as a vaccine composition because the mannose binding domain of the polypeptide would be tied up with mannose.

With respect to claim 10, directed to a vaccine composition, Applicants observe that Krogfelt et al only disclose use of the entire protein or the entire fimbriae. The Examiner argues that Krogfelt shows FimH bound to a carrier but in fact it is mannose that is bound to the carrier and not FimH (see Krogfelt et al at page 1995, column 2, second full paragraph, lines 4-6). In addition, Kroagfelt et al (1990) does not teach that use of a smaller section of the protein can be used but only employs the entire protein, no part of which comprises residues 25-186 of SEQ ID NO: 29. Conversely, the Applicants have determined that smaller portions of the protein are required for

immunogenic activity (here, residues 26-186 of, for example, SEQ ID NO: 29). This discovery is neither anticipated by, nor obvious over, the disclosure of Krogfelt et al., because nothing in the reference suggests that less than the entire protein would be useful for forming an immunogenic polypeptide.

Applicants also contend that the fact that the protein disclosed by Krogfelt et al (1990) was present in a buffer does not enable its use as a vaccine or immunogenic composition because such use of those proteins in affording protection against bacterial infection is not disclosed. Such disclosure cannot seriously be compared with Applicants teaching of such use (see, for example, the results of Example 1 and table 2, on page 29, of the application, showing use of strain J96 FimH (SEQ ID NO: 44), the production of anti-sera (from rabbits), or use of the polypeptide either alone or complexed with FimC chaperone (denoted FimCH in Table 2) in protecting against bladder infection by the different strains of E. coli whose FimH variant proteins are disclosed by Applicants in mice subsequently challenged with such strains of E. coli.

In sum, neither reference relied on by the Examiner discloses an isolated polypeptide, immunogenic or otherwise, comprising residues 26-186 of any of the Applicants' disclosed sequences (SEQ ID NO: 23-45 and 55) and certainly not of SEQ ID NO: 29. Thus, claims 1-3 and 10 should be allowable.

The Commissioner is authorized to charge any and all additional fees to Deposit Account No. 03-0678.

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